

1108-57-369

Chris Connell* (connell@indiana.edu), **Benson Farb** and **Ben McReynolds**. *A gap in the homological dimensions of discrete subgroups of $Sp(n; 1)$ and F_4^{-20}* . Preliminary report.

Let G be a torsion-free, finitely generated discrete subgroup of either the isometry group of quaternionic or Cayley hyperbolic space; that is, up to isogeny, $G < Sp(n; 1)$ for $n \geq 2$ or $G < F_4^{-20}$. We prove that if G contains no parabolics then there is a gap in the possible homological dimension $hd(G)$ of G . Namely, if $G < Sp(n; 1)$, either $hd(G) = 4n$ or $hd(G) \leq 4n - 2$, and if $G < F_4^{-20}$, then either $hd(G) = 16$ or $hd(G) \leq 12$. This result does not hold in the real or complex hyperbolic cases, or if G is allowed to have parabolics (even for subgroups of lattices). Our method requires a generalization of work of Besson–Courtois–Gallot on estimates of p -Jacobians of natural maps. We also generalize an inequality of M. Kapovich between the homological dimension and critical exponent for discrete subgroups of the isometry group of real hyperbolic n -space. This is joint work with Benson Farb and Ben McReynolds. (Received January 18, 2015)